

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (previously presented) A semiconductor laser apparatus having a vertical emitter and having at least one pump laser for optically pumping the vertical emitter, with the vertical emitter and the pump laser being monolithically integrated,

wherein,

during operation, the pump laser has a radiation-emitting zone at a first temperature T1 and the vertical emitter has a radiation-emitting zone at a second temperature T2, and the first temperature T1 is lower than the second temperature T2.

2. (previously presented) The semiconductor laser apparatus as claimed in claim 1, wherein

the pump laser and the vertical emitter are epitaxially grown on a common substrate.

3. (previously presented) The semiconductor laser apparatus as claimed in claim 1, wherein

the pump laser and the vertical emitter are mounted on a common mount.

4. (previously presented) The semiconductor laser apparatus as claimed in claim 3, wherein

a thermal resistance between the mount and the radiation-emitting zone of the pump laser is less than the thermal resistance between the mount and the radiation-emitting zone of the vertical emitter.

5. (previously presented) The semiconductor laser apparatus as claimed in claim 3, wherein the vertical emitter and the pump laser are arranged between a substrate and the mount.

6. (previously presented) The semiconductor laser apparatus as claimed in claim 3, wherein one mirror layer or two or more mirror layers is or are arranged between the radiation-emitting zone of the vertical emitter and the mount.

7. (previously presented) The semiconductor laser apparatus as claimed in claim 6, wherein the mirror layer or the mirror layers is or are formed as a Bragg mirror.

8. (previously presented) The semiconductor laser apparatus as claimed in claim 1, wherein the pump laser has an active layer comprising its active zone, and the vertical emitter has an active layer comprising its active zone, with the active layer of the

pump laser and the active layer of the vertical emitter having at least one of an identical structure and composition.

9. (previously presented) The semiconductor laser apparatus as claimed in claim 1, wherein
at least one of an active layer of the pump laser and an active layer of the vertical emitter is formed as a quantum well structure.

10. (previously presented) The semiconductor laser apparatus as claimed in claim 1, wherein
an active layer of the pump laser and an active layer of the vertical emitter are formed jointly in one epitaxy step.

11. (previously presented) The semiconductor laser apparatus as claimed in claim 1, wherein
the radiation-emitting zone of the pump laser produces pump radiation,
which is injected into the radiation-emitting zone of the vertical emitter in a direction oblique or perpendicular to a main emission direction of the vertical emitter.

12. (previously presented) The semiconductor laser apparatus as claimed in claim 1, wherein
the pump laser is formed as an edge emitter.

13. (previously presented) The semiconductor laser apparatus as claimed in claim 1,
wherein
the vertical emitter is formed as a vertically emitting laser.
14. (previously presented) The semiconductor laser apparatus as claimed in claim 8,
wherein
at least one of the active layer of the pump laser and the active layer of the
vertical emitter is formed as a quantum well structure.
15. (previously presented) The semiconductor laser apparatus as claimed in claim 8,
wherein
the active layer of the pump laser and the active layer of the vertical
emitter are formed jointly in one epitaxy step.
16. (previously presented) The semiconductor laser apparatus as claimed in claim 8,
wherein
the radiation-emitting zone of the pump laser produces pump radiation,
which is injected into the radiation-producing zone of the vertical emitter in a direction
oblique or perpendicular to a main emission direction of the vertical emitter.
17. (previously presented) The semiconductor laser apparatus as claimed in claim 8,
wherein
the pump laser is formed as an edge emitter.

18. (currently amended) The semiconductor laser apparatus as claimed in claim 8,
wherein
the vertical emitter is formed as a vertically emitting laser.
19. (previously presented) The semiconductor laser apparatus as claimed in claim 3,
wherein
the common mount is a heat sink.
20. (previously presented) The semiconductor laser apparatus as claimed in claim 13,
wherein
the vertical emitting laser is a VCSEL or a disk laser.
21. (previously presented) The semiconductor laser apparatus as claimed in claim 18,
wherein
the vertical emitting laser is a VCSEL or a disk laser.